

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): A parallel processing system for operating by an OS for single processors which

operates an OS for single processors and an application on a multiprocessor, and controls a unit of work that can be parallelized within said application operating on one processor as a new unit of work on other processor, thereby conducting parallel processing by said multiprocessor with respect to said application, and an application on a plurality of processors and achieving parallel processing by said plurality of processors with respect to said application, comprising:

a parallel processing unit which controls units of work which are parallel processable within said application on one processor of the plurality of processors as new units of work on another processor of the plurality of processors, which parallel processing unit belongs to one processor of said plurality of processors: and

an inter-process communication unit which controls inter-process communication between processes executed on the plurality of processors,

wherein said inter-process communication unit receives a system call request related to said inter-process communication issued from processes of said one processor or said another

processor to said OS for single processors and issues a request for process control to said OS for single processors of said one processor or said another processor by using a system call.

2. (currently amended): ~~A~~The parallel processing system by an OS for single processors
~~which~~
~~operates an OS for single processors and an application on a multiprocessor,~~
~~said multiprocessor being logically divided into two groups of a first processor side and a~~
~~second processor side, and~~
~~controls a unit of work that can be parallelized within said application operating on a~~
~~processor on said first processor side as a new unit of work on a processor on said second~~
~~processor side, thereby conducting parallel processing by said multiprocessor with respect to said~~
~~application as set forth in claim 1,~~
wherein, said plurality of processors are logically divided into at least two groups of at
least a first processor group and a second processor group;
wherein, said parallel processing unit belonging to one processor of said first processor
group sends a request for units of work that are parallel processable within said application on
said first processor group to at least one processor of said second processor group, and
wherein, said at least one processor of said second processor group controls the units of
work as a new units of work based on said request.

3. (currently amended): A ~~The parallel processing system by an OS for single processors~~
which
~~operates an OS for single processors and an application on a multiprocessor,~~
~~said multiprocessor being divided into two groups of a first processor side and a second~~
~~processor side,~~
~~operates said OS for single processors and said application on a processor on said first~~
~~processor side, and~~
~~controls a unit of work that can be parallelized within said application as a new unit of~~
~~work on a processor on said second processor side, thereby conducting parallel processing by~~
~~said multiprocessor with respect to said application as set forth in claim 2, wherein said inter-~~
~~process communication unit is provided on a processor of said first processor group and on a~~
~~processor of said second processor group.~~

4. (currently amended): The parallel processing system ~~by an OS for single processors as~~
set forth in claim ~~1~~, 2, wherein
the unit of work that can be parallelized within said application is created in advance on a
processor on said second processor ~~side~~, group.

5. (currently amended): The parallel processing system ~~by an OS for single processors as~~
set forth in claim ~~1~~, 2, wherein

the unit of work that can be parallelized within said application is created and activated as a new unit of work on a processor on said second processor ~~side-group~~.

6. (currently amended): The parallel processing system ~~by an OS for single processors as~~ set forth in claim 2, wherein

said OS for single processors having a virtual memory mechanism is mounted on at least one the processor on said first processor ~~side-group~~ and each processor on said second processor ~~side-group~~.

7. (currently amended): The parallel processing system ~~by an OS for single processors as~~ set forth in claim 6, wherein

the new unit of work on at least one of the ~~processor~~processors on said second processor ~~side-group~~ is controlled synchronously or asynchronously with the unit of work on the at least one processor on said first processor ~~side-group~~.

8. (currently amended): The parallel processing system ~~by an OS for single processors as~~ set forth in claim 6, wherein

synchronous processing and data transmission and reception are enabled between units of work on the at least one processor on said first processor ~~side-group~~ and on at least one the processor on said second processor ~~side-group~~.

9. (currently amended): The parallel processing system ~~by an OS for single processors~~ as set forth in claim 8, wherein

~~the~~ an inter-process communication unit which executes synchronous processing and data transmission and reception between said units of work by a semaphore system and a message queue system is provided on the at least one processor on said first processor ~~side-group~~ and on the at least one processor on said second processor ~~side-group~~.

10. (currently amended): The parallel processing system ~~by an OS for single processors~~ as set forth in ~~claim 1~~ claim 2, wherein

a parallel processing unit which conducts control related to the unit of work including said creation of the unit of work and an OS service unit which provides service of said OS for single processors to said unit of work are incorporated into each of said first processor ~~side-group~~ and said second processor ~~side-group~~.

11. (currently amended): The parallel processing system ~~by an OS for single processors~~ as set forth in ~~claim 1~~ claim 2, comprising

a control processing relay unit which conducts transmission and reception of a control signal and data between said first processor ~~side-group~~ and said second processor ~~side-group~~.

12. (currently amended): The parallel processing system ~~by an OS for single processors~~ as set forth in claim 11, wherein

said control processing relay unit includes an interruption control device corresponding to each processor and a communication region corresponding to each processor,

said interruption control device being formed of an interruption instruction unit which instructs other processor to interrupt, an interruption state holding unit which holds information that an interruption is made by an interruption instruction and an interruption cancellation unit which clears an interruption, and

said communication region being formed of a communication reason holding region which holds a communication reason from a communication source processor, a communication data holding region which holds communication data to be communicated and a mutual exclusive control region which locks a communication region to ensure communication.

13. (currently amended): The parallel processing system ~~by an OS for single processors~~ as set forth in claim 11, wherein

said control processing relay unit includes an interruption control device corresponding to each processor and a communication region corresponding to each processor,

said interruption control device being formed of an interruption instruction unit which instructs other processor to interrupt, an interruption state holding unit which holds information that an interruption is made by an interruption instruction and an interruption cancellation unit which clears an interruption, and

said communication region being formed of a communication queue which holds a communication reason from a communication source processor and communication data to be

communicated and a mutual exclusive control region which locks a communication region to ensure communication.

14. (currently amended): The parallel processing system ~~by an OS for single processors~~ as set forth in claim 10, wherein

a proxy unit is provided on said first processor ~~side, group,~~ which is associated with the unit of work on said second processor ~~side-group~~ by a processing unit number to conduct notification of various kinds of control signals between the unit of work on said second processor side and said OS for single processors.

15. (currently amended): The parallel processing system ~~by an OS for single processors~~ as set forth in claim 10, wherein

said parallel processing unit, the OS service unit, the control processing relay unit and the proxy unit are incorporated in a modular fashion.

16. (currently amended): The parallel processing system ~~by an OS for single processors~~ as set forth in claim 10, wherein

said parallel processing unit on said second processor ~~side-group~~ is provided with a function of creating a unit of work to be parallel-processed by other processor on said second processor ~~side-group~~.

17. (currently amended): The parallel processing system ~~by an OS for single processors~~
as set forth in claim 1, wherein

each said processor is mounted with said OS for single processors having a virtual
memory mechanism to enable synchronous processing and data transmission and reception
between the units of work on said one processor and said other processor.

18. (currently amended): The parallel processing system ~~by an OS for single processors~~
as set forth in claim 17, wherein

~~the an~~ inter-process communication unit ~~which~~ executes synchronous processing and data
transmission and reception between said units of work by using a semaphore system and a
message queue system is provided on each said processor.

19. (currently amended): The parallel processing system ~~by an OS for single processors~~
as set forth in claim 17, comprising

a control processing relay unit which conducts transmission and reception of a control
signal and data at the time of synchronous processing and data transmission and reception
between said units of work on each said processor.

20. (currently amended): A parallel processing program ~~by an OS for single processors,~~
stored on a computer-readable medium for achieving parallel processing by a plurality of
processors with respect to an application on a parallel processing system for operating an OS for

single processors and said application on said plurality of processors, comprising the functions of:

~~operating an OS for single processors and an application on a multiprocessor, and
controlling a unit of work that can be parallelized within said application operating on
one processor as a new unit of work on other processor to conduct parallel processing by said
multiprocessor with respect to said application.~~

a parallel processing function of controlling units of work which are parallel processable
within said application on one processor of the plurality of processors as new units of work on
another processor of the plurality of processors; and

an inter-process communication function of controlling inter-process communication
between processes executed on the plurality of processors;

wherein said inter-process communication function includes

a function of receiving a system call request related to said inter-process communication
issued from processes of said one processor or said another processor to said OS for single
processors; and

a function of issuing a request for process control to said OS for single processors of said
one processor or said another processor by using system call.

21. (currently amended): ~~A-The parallel processing program stored on a computer-
readable medium as set forth in claim 20, by an OS for single processors, comprising the
functions of:~~

~~operating an OS for single processors and an application on a multiprocessor, and
on a system in which said multiprocessor is logically divided into two groups of a first
processor side and a second processor side,~~

~~controlling a unit of work that can be parallelized within said application operating on a
processor on said first processor side as a new unit of work on a processor on said second
processor side to conduct parallel processing by said multiprocessor with respect to said
application.~~

wherein, said plurality of processors are logically divided into at least two groups of at
least a first processor group and a second processor group;

wherein said parallel processing function belonging to one of said processors of said first
processor group sends a request for units of work that are parallel processible within said
application on said first processor group to at least one processor of said second processor group;
and

wherein, said at least one processor of said second processor group controls the units of
work as new units of work based on said request.

22. (currently amended): ~~A-The parallel processing program stored on a computer-
readable medium by an OS for single processors, comprising the functions of:~~

~~operating an OS for single processors and an application on a multiprocessor,
on a system in which said multiprocessor is logically divided into two groups of a first
processor side and a second processor side,~~

~~operating said OS for single processors and said application on a processor on said first processor side, and~~

~~controlling a unit of work that can be parallelized within said application as a new unit of work on a processor on said second processor side to conduct parallel processing by said multiprocessor with respect to said application.~~

as set forth in claim 21, wherein said inter-process communication function is provided on a processor of said first processor group and on a processor of said second processor group.

23. (currently amended): The parallel processing program ~~by an OS for single processors~~
stored on a computer-readable medium as set forth in claim ~~20, 21~~, comprising the function of
creating the unit of work that can be parallelized within said application in advance on a
processor on said second processor ~~side~~group.

24. (currently amended): The parallel processing program ~~by an OS for single processors~~
stored on a computer-readable medium as set forth in claim ~~20, 21~~, comprising the function of
creating and activating the unit of work that can be parallelized within said application as
a new unit of work on a processor on said second processor ~~side~~group.

25. (currently amended): The parallel processing program ~~by an OS for single processors~~
stored on a computer-readable medium as set forth in claim ~~20, 21~~,

which is executed on at least onethe processor on said first processor side-group and each processor on said second processor sidegroup mounted with said OS for single processors having a virtual memory mechanism.

26. (currently amended): The parallel processing program ~~by an OS for single processors~~ stored on a computer-readable medium as set forth in claim 25, comprising the function of controlling the new unit of work on at least onethe processor on said second processor side-group synchronously or asynchronously with the unit of work on the at least one processor on said first processor side-group.

27. (currently amended): The parallel processing program ~~by an OS for single processors~~ stored on a computer-readable medium as set forth in claim 25, comprising the function of enabling synchronous processing and data transmission an reception between units of work on the at least one processor on said first processor side-group and on the at least one processor on said second processor side-group.

28. (currently amended): The parallel processing program ~~by an OS for single processors~~ stored on a computer-readable medium as set forth in claim 27, wherein ~~thean~~ inter-process communication function ~~executesof executing~~ synchronous processing and data transmission and reception between said units of work by using a semaphore

system and a message queue system is executed on the at least one processor on said first processor ~~side-group~~ and on the at least one processor on said second processor ~~side-group~~.

29. (currently amended): The parallel processing program ~~by an OS for single processors~~ stored on a computer-readable medium as set forth in claim ~~20, 21~~, wherein

each of said first processor ~~side-group~~ and said second processor ~~side-group~~ is provided with a parallel processing function of conducting control related to the unit of work including said creation of the unit of work and an OS service function of providing service of said OS for single processors to said unit of work.

30. (currently amended): The parallel processing program ~~by an OS for single processors~~ stored on a computer-readable medium as set forth in claim ~~20, 21~~, comprising

a control processing relay function of conducting transmission and reception of a control signal and data between said first processor ~~side-group~~ and said second processor ~~side-group~~.

31. (currently amended): The parallel processing program ~~by an OS for single processors~~ stored on a computer-readable medium as set forth in claim 29, comprising

on said first processor ~~side-group~~, a proxy function which is associated with the unit of work on said second processor ~~side-group~~ by a processing unit number to conduct notification of various kinds of control signals between the unit of work on said second processor side and said OS for single processors.

32. (currently amended): The parallel processing program ~~by an OS for single processors~~
stored on a computer-readable medium as set forth in claim 29, wherein

said parallel processing function on said second processor ~~side-group~~ creates a unit of
work to be parallel-processed by other processor on said second processor ~~side-group~~.

33. (currently amended): The parallel processing program ~~by an OS for single processors~~
stored on a computer-readable medium as set forth in claim 20, wherein

on each said processor mounted with said OS for single processors having a virtual
memory mechanism, synchronous processing and data transmission and reception is enabled
between the units of work on said one processor and said other processor.

34. (currently amended): The parallel processing program ~~by an OS for single processors~~
stored on a computer-readable medium as set forth in claim 33, wherein

~~the~~an inter-process communication function ~~executes~~~~of executing~~ synchronous
processing and data transmission and reception between said units of work by using a semaphore
system and a message queue system is executed on each said processor.

35. (currently amended): The parallel processing program ~~by an OS for single processors~~
stored on a computer-readable medium as set forth in claim 33, wherein

a control processing relay function of conducting transmission and reception of a control signal and data is executed at the time of synchronous processing and data transmission and reception between said units of work on each said processor.